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"The clock (shown behind the circle) was a small kitchen affair, and kept execrable time. It had no second-hand, and the observer made an observation by looking at the clock-face after the star was on one of the wires, mentally allowing a little for the time necessary to get up from his position at the telescope and go to the clock, and estimating the seconds as best he could.

"The instrument was protected when not in use by a cover or hood made of wood, and roofed with tarred paper, which rested upon the cleats nailed around the tops of the piers.

"To the north the horizon was invisible on account of the forest, but to the south a long sight could be obtained across the salt marsh, and a tall pine-tree nearly on the meridian served for the purposes of collimation."

A POPULAR ACCOUNT OF THE CHABOT OBSERVATORY-DOLBEER ECLIPSE EXPEDITION TO SILOAM, GEORGIA, MAY 28, 1900.

By Charles Burckhalter.

The expedition from this observatory to observe the late eclipse was at the sole expense of Mr. John Dolbeer, of San Francisco, who also paid my salary while absent from the observatory. The lantern-slides and other work sent out since my return have also been at his expense, and there yet remains a considerable balance which he refuses to receive, thus leaving me in possession of riches I scarely know what to do with,— to me a most novel and unique experience. Mr. Dolbeer had generously settled the matter nearly a year before it was necessary for me to start; the Board of Education of the city of Oakland and Superintendent McClymonds had given me the necessary leave of absence, also granting permission to use any part of the instrumental equipment of the observatory, so that I had ample time to prepare. The above happy condition is not always realized, and many a blunder has been made because preparations had to be rushed. The very greatest care must be observed in every detail of the preliminary arrangements since the result depends upon the rapid work of a few seconds. When I shipped the instruments, six weeks before I started myself, they were as ready as I could make them. Freight is an uncertain quantity across the continent, but the instruments reached their destination about three weeks before I arrived myself.

My principal instrument was the Pierson eclipse-telescope, presented by Mr. WM. M. PIERSON to this observatory for the expedition to Japan in 1896, to which was added the duplicate lens presented by Dr. GEO. C. PARDEE for the Indian Expedition, making really a double telescope. The lenses are four inches aperture and fifteen feet focal length. A new equatorial mounting was made during my leisure time upon the same principles as that used in India, which is decribed in the Indian Report.* Some new plate-holders were added, my programme being arranged for five exposures in each telescope, if time permitted. Nine of these were to have the exposures controlled, the remaining one uncontrolled, for comparison. The proposed exposures were printed in No. 73 of these *Publications*, but the persistent grayness of the sky during the two weeks preceding the eclipse led me to change the two ten-second exposures to eight seconds, as I felt confident that ten seconds would over-expose the sky; and the result proves the wisdom of the change.

I started from home on April 24th, and had the unexpected pleasure of finding myself in the same car with Professors CAMPBELL and PERRINE, of the Lick Observatory Expedition, for the long ride across the continent.

I expected to establish the station at or near Union Point, Georgia; but upon arrival observation proved that the town was about seven miles northwesterly from the central line of totality, and I could not afford the serious loss of time this distance from the central line would cause. This was a great disappointment to me, as well as to Mr. WM. HART, and others, who had given me much valuable information, and who were also to be volunteer assistants. After some exploring to the southeast, I went to Siloam, a little village in the right direction. The maps issued by the Naval Observatory placed the village about a mile southeasterly of the central line, but preliminary observations placed it about one and one half miles northwesterly; but this gave me practically the full time of totality, and I decided to establish the station in this quiet little village, it having railroad connection, so that the instruments could be easily transferred.

The conditions of the situation selected for the station were just about perfect; a near-by empty store building—the property

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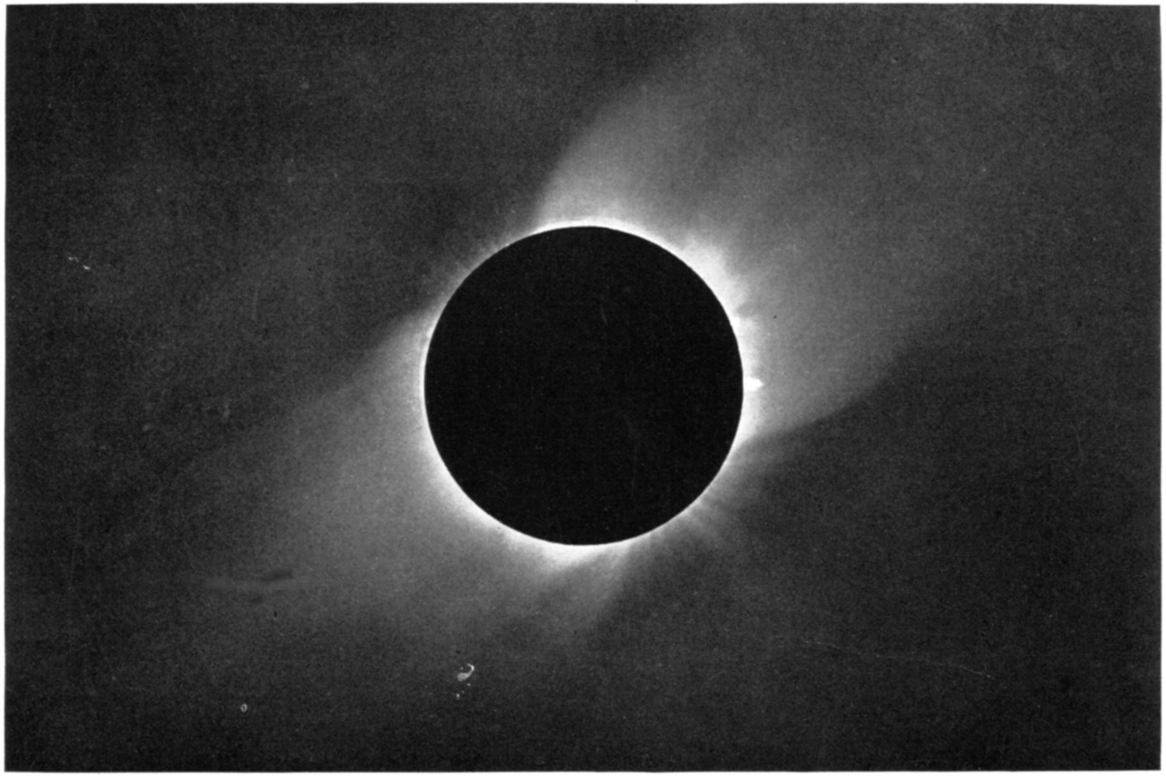
* See also these *Publications*, No. 65.



THE CORONA, MAY 28, 1900.—NEGATIVE No. 6.

CHABOT OBSERVATORY-DOLBEER ECLIPSE EXPEDITION, SILOAM, GEORGIA.

Exposure given, counting from Sun's center.	At—	16′	20′	24′	28′	32′	40′	50′	60′	80′	110′
		s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
	Time—	0.04	0.32	0.80	1.38	1.76	2.40	3.20	4.00	5.60	8.00

of Mr. STANLEY — was placed at my disposal, giving me a splendid place to unpack my instruments, and furnishing protection until the temporary observatory could be erected. My boarding-place was within a stone's throw. A well of good water was near by, which, with buckets and barrels always kept full, furnished protection against possible fire. Several stores and blacksmith and wagon shops, from which volunteer help to "give us a lift" could be had for the asking at any time, and, lastly, a convenient lumber-pile, to which I was invited to "help myself," completely filled all important requirements.

The readiness of the villagers to give me any help in their power was very gratifying, and fully repaid me for the idle curiosity they sometimes manifested. Many were with me much of their leisure time, and I was seldom entirely alone; but they were so good-natured and good-humored about it that I could not but let them say and do as they pleased without protest, especially as many considered this expedition "the biggest thing that ever happened to Siloam!"

The colored folk were immensely interested and impressed, the whole surrounding neighborhood, it seemed to me, coming to see and marvel. They had many curious ideas, and even some of the whites were lacking in a very deep knowledge of things "eclipse-wise." Many thought it was a money-making scheme, and what I intended to charge for admission was a very important question, frequently asked. Another idea was that the eclipse could be seen only from the inside of my observatory. I had a camera with me that at once became very popular. Requests to take their pictures were frequent, and sometimes persistent, and as all I did was "without money and without price," business would have been brisk if I had had the time to attend to it. But, taken altogether, my stay of five weeks in the village was as pleasant as one could expect while upon an eclipse expedition, which means hard work, worry, and anxiety, for the villagers fully sustained the great reputation of the Southern people for hospitality, and I received attention and favors that I had no right to expect. Just here I wish to express my appreciation of the high moral tone of the community, for, with a population of only one hundred, including the immediate neighborhood, it sustains two white and two colored churches, and during my stay I did not hear a single profane word by a citizen of this model village, situate in the heart of the "Cotton Belt."

By the kindness of J. CONKLIN BROWN, of Berkeley, who had lived for thirty years in Greensboro — seven miles distant — I was given letters that brought a perfect deluge of offers of help. With the friends at Union Point also doing all in their power to help me, this placed my enviable position in strong contrast with the lone Camp Pierson in India, where I was placed entirely upon my own resources. My greatest need seemed to be some one to help me decline the very pressing invitations I so frequently received to visit these friends at their homes.

As an unsophisticated Yankee in the Southland, unused to Southern ways, I naturally made many little slips that were not considered "just the thing." The smiles at my prefixing "Mister" to the name of my colored helper caused me to change it to "Colonel," which was entirely satisfactory to everybody, and did not materially increase the number of colonels. As he reminded me of my faithful Indian cook, Mustapha, his full and official title is now "Colonel Mustapha Berry Evans," and he now enjoys among his friends the reputation of being an astronomer of no mean ability.

Within a week the telescopes were in rough position, my observatory, sixteen by twenty-four feet floor-space, and eight to twenty-two feet high, was completed, and I was ready for the worst part of the work — the little things. The weather and sky were superb, everything seemed to prosper, and I began to look about for assistants; for I had undertaken the expedition alone. These were chosen from among the people of the village. I had received several offers of help from Atlanta, Athens, and other towns; but I needed assistants close at hand, in order to have them practice their parts often, skill being of more importance with me than knowledge. Besides, I did not have to *unlearn* them. They were clerks, merchants, blacksmiths, and farmers by occupation. Their work was simple, yet the success of the expedition rested largely upon them, for I could not have accomplished one half the programme by myself; and the fact that the entire programme went through without a hitch, proves how faithfully and well they did their work. We had many rehearsals, — two during daylight, the remainder at night, each time going through the full programme several times, just as we expected to do on eclipse day. There were two men trained for each important place and an extra man for emergencies.

The weather, that overshadowing question at eclipses, became unsettled about the 18th, and my records show that I had only about one chance in ten for clear weather — and I have since heard that there were but two clear days in the following six weeks! We had some severe thunder-storms with heavy wind. One squall made the buildings in the village crack, and I feared for a time for the safety of the temporary observatory; but it gallantly rode out the storm, a thorough soaking to my bed and some books being the only damage.

On eclipse day the sky was about three tenths cloudy near the eastern horizon, the wind was southeast, drifting the clouds toward me, and for a time I felt intensely anxious; but by first contact the sky was nearly clear, my only fear being that the drop in temperature would chill the moisture-laden air again. I had an hour of doubts and fears; but the sky remained clear, but very gray, which confirmed me in my determination to cut my two ten-second exposures to eight seconds.

The programme went through perfectly. Not a word was spoken except the ones agreed upon. Each one had an opportunity for a short glance at this, Nature's greatest phenomenon; and just four seconds after the last exposure was completed a beam of sunlight brilliantly proclaimed that the eclipse was over. It began clouding up immediately, and we had "a right smart" sprinkle before noon, which I observed with genuine satisfaction, for the long strain and anxiety had ended with totality.

Two plates were developed at once in the closet under the stairs of Mr. FILLINGHIM'S house; the remaining eight were taken to Professor BARNARD, at Yerkes Observatory, and to Secretary ZIEL, at home, for expert development. The two plates developed had received extremes of exposure for the inner corona, and as they were respectively slightly under and over exposed, as I had hoped, I knew the plates with intermediate exposures, upon which my hopes were centered, would be all right. So I began packing up the instruments, leaving the village four days later, thus breaking my best record in packing up.

The results obtained will be more fully discussed in the forthcoming report, and the following description of the more characteristic negatives must suffice here.

No. 1 is a curiosity in at least one respect — the extreme inner corona is thoroughly *under-exposed.* At the Moon's edge the exposure was only $0^s.02$. The prominences seem to have been perfectly exposed, being full of delicate detail, the chromosphere was over-exposed, while the corona is so faint that by hard printing it can be printed out entirely, leaving only the prominences and chromosphere.

No. 5 was exposed eight seconds without control, for I wanted one uncontrolled plate to compare with the others. It is an excellent negative, but shows nothing whatever near the Moon's limb.

No. 6 was made during the same interval, receiving precisely the same total exposure as No. 5. These plates are, therefore, strictly comparable. The exposure of No. 6 at 16′ from the Sun's center was $0^{s}.04$, thus giving the corona at 110′ distance two hundred times more exposure than at 16′. This is my second-best negative, the printing qualities being exceptionally good.

No. 7 shows a greater extension on the eastern side of the Sun than any other plate. It can be traced with certainty to 84′. The exposure at 16′ was $0^{s}.08$ — too much for best results. It shows all the prominences, but not in such detail as other plates.

No. 8 is very much the best negative from a scientific standpoint, but unfortunately it has some specks on the film, and besides has been somewhat over-developed. It is a hard printer, and, so far, I have not been able to obtain results that are reasonably satisfactory.

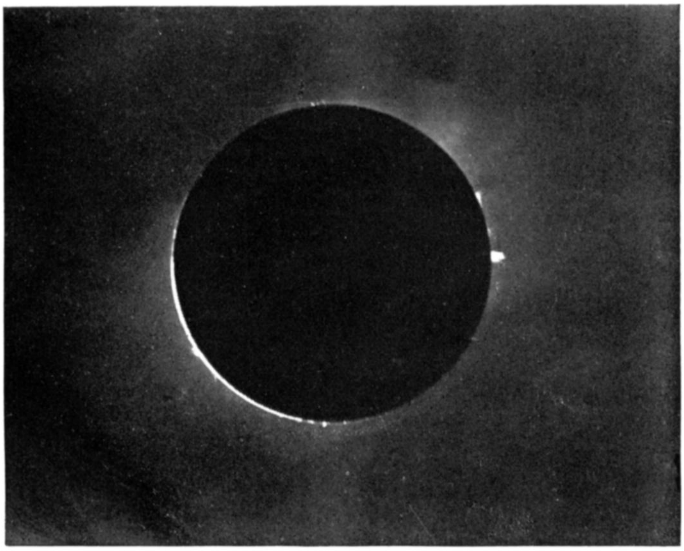
No. 9 and No. 10 have exquisite inner detail, but not such good extension.

For the Pierson telescope, using Cramer crown plates, $0^{s}.04$ to $0^{s}.05$ was the proper exposure for the extreme inner corona, and $8^{s}.00$ gave me the best extension. On the Chabot Observatory-Pierson expedition to India, the shortest exposure was $0^{s}.08$. The Indian corona was much brighter than the recent one, and $0^{s}.03$ would have been about right there, but such an exposure with a four-inch lens with fifteen feet focus would have been thought ridiculous at that time. While the shortest Indian exposure was about three times too much for best results, it gave me the very knowledge I needed to make the Georgia expedition a success. I asked advice from no one this time, but used my own judgment, No. 8 being my ideal plate. The exposure, it seems to me, is precisely right in every part.

I cannot close this article without grateful acknowledgments to the Southern Pacific Company, for half-rates on freight, and to Mr. HORSBURGH, of the Passenger Department, for half-rates of fare; also to the Northern Pacific Railway and the Pacific

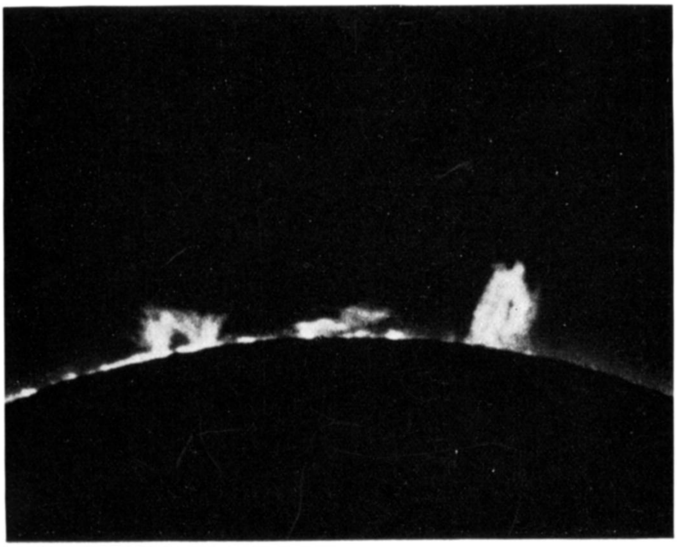
THE CORONA, MAY 28, 1900.

Chabot Observatory-Dolbeer Eclipse Expedition, Siloam, Georgia.



From Negative No. 1, from 0 to 4th second of totality:

Exposure given, counting from Sun's center.	At—	16′	18′	20′	24′	28′
		s.	s.	s.	s.	s.
	Time—	0.02	0.08	0.18	0.42	0.78



Part of Negative No. 10, six seconds exposure, from 77th to 82d second (inclusive) of totality, from a print made from a negative, made from a positive enlarged 6 diameters:

Exposure given, counting from Sun's center.	At—	16′	18′	20′	24′	28′
		s.	s.	s.	s.	s.
	Time—	0.06	0.12	0.25	0.62	1.16

Coast Steamship Company, for half-rates over their lines. In fact, it were better to thank every person with whom I came in contact, for without exception I was helped by everybody that could help me. I wish to express my appreciation of the kindness received from Judge HART and his nephews, WILLIAM and H. B. HART, of Union Point, and to thank Mr. LITTLE, Mr. ROSSMAN, and many others of Greensboro for their splendid hospitality. My stay in the Sunny South was made so pleasant that the name of Georgia is synonymous with friendship, hospitality, and good-will.

The following assistants have placed me under obligations and aided science: J. T. BRYSON, D. A. SAGGUS, J. M. SAGGUS, H. H. ANDREWS, A. S. ONEAL, W. J. ONEAL, E. J. STANLEY, JNO. T. BOSWELL, CLAY FILLINGHIM, all of Siloam; and Mrs. ROBINSON, of Greenboro, who made drawings of the corona.

Finally, I must not forget "Colonel Mustapha" Berry Evans, the colored wag of the village, who carries the mail from the post-office to the station four times a day for less than three dollars a month, but manages to make his living with less work than any man in the neighborhood. He was my helper throughout. There is a smile in the story of how he would have assisted me more if I had applied to him in time. I was making sextant observations for position one night, and this aroused his curiosity. In answer to his question of what I was doing, I told him I was trying to find out exactly where I was. His amazement and pity for my ignorance found expression in "Foh de Lawd's sake! why did n't you ask me? I was done bo'n and brought up heah! You 's *right heah in Siloam.* I reckon you 's foolin' me!"

CHABOT OBSERVATORY, OAKLAND, CAL., September, 1900.

THE CROCKER EXPEDITION TO OBSERVE THE TOTAL SOLAR ECLIPSE OF MAY 28, 1900.

BY W. W. CAMPBELL AND C. D. PERRINE.

The generosity of WILLIAM H. CROCKER,[*] of San Francisco, enabled the Lick Observatory to send an expedition to observe the total solar eclipse of May 28, 1900. The organization of

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[*] Mr. CROCKER's brother, the late Colonel C. F. CROCKER, Regent of the University of California, had similarly befriended the Lick Observatory, in the Expeditions sent to Cayenne in 1889, to Japan in 1896, and to India in 1897-98.